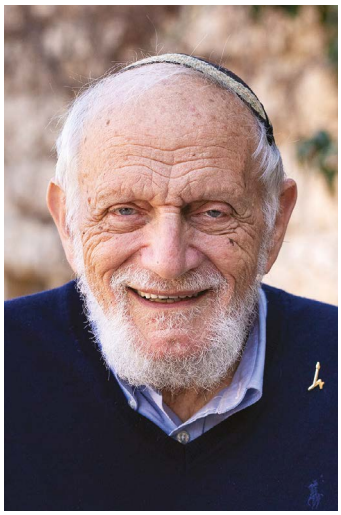
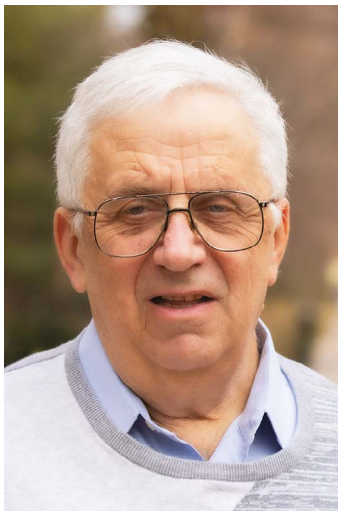
News in brief





L TO R: YOSEF ADEST, DAN RENZETTI; LEON NEAL/GETTY; JUNG YEON-JE/AFP/GETTY

MATHEMATICS PIONEERS WHO FOUND ORDER IN CHAOS WIN ABEL PRIZE

Two mathematicians who used randomness to cast light on the certainties of mathematics have won the 2020 Abel Prize — one of the field's most prestigious awards.

Israeli Hillel Furstenberg (above, left) and Russian American Gregory Margulis won "for pioneering the use of methods from probability and dynamics in group theory, number theory and combinatorics". Each of them bridged gaps between diverse areas of maths, solving problems that had seemed beyond reach. The Norwegian Academy of Science and Letters, which awards the prize, announced it on 18 March.

A common thread in the mathematicians' work has been the use of techniques from ergodic theory, a field that originated in the study of physics problems such as the motion of billiard balls or planetary systems. It studies the behaviour of chaotic systems that evolve in time, exploring almost all their possible configurations using probability.

In seminal papers in the 1960s and 1970s, Furstenberg used ergodic ideas to show how even the most random sets of infinitely many whole numbers had to conceal some kind of regular structure. Margulis built on some of Furstenberg's ideas in his own work on the theory of symmetries, which encompasses continuous transformations in geometry, such as the rotations of a sphere.

The Abel Prize is named after Norwegian mathematician Niels Henrik Abel (1802–29) and was established in 2003. The two winners will share 7.5 million Norwegian kroner, about US$625,000.

Furstenberg said that he reacted with "total disbelief" when he learnt he had won. "I had known about the prestige of the Abel Prize and knew the list of former laureates," he told an interviewer during the announcement. "I simply felt that these are people of a certain league, and I was not in that league." Margulis said that he, too, felt greatly honoured to receive such recognition.

Because of the ongoing coronavirus pandemic, the academy decided to postpone the award ceremony, which was due to take place in Oslo in May. Instead, the 2021 ceremony will celebrate winners for both the 2020 and 2021 prizes.

COVERT CASES OF CORONAVIRUS COULD BE SEEDING NEW OUTBREAKS

As coronavirus outbreaks surge worldwide, research teams are racing to understand what proportion of infected people have mild or no symptoms and might be spreading the virus.

A team of researchers in China and the United States developed a model using clinical data from 26,000 laboratory-confirmed cases reported to the health commission of Wuhan, the epicentre of the outbreak.

In a preprint posted online on 6 March, the group suggests that by 18 February, there were 37,400 people with the virus in Wuhan whom authorities didn't know about — roughly 60% of all infections (C. Wang *et al.* Preprint at medRxiv http://doi.org/ggntm2; 2020). Most such cases were in people who had mild or no symptoms but could be contagious, say the authors.

"This may explain why the virus spread so quickly in Hubei and is now circulating around the world," says co-author Wu Tangchun, a public-health expert at Huazhong University of Science and Technology in Wuhan.

The results are within the range of estimates of other studies based on smaller data sets, says Adam Kucharski, a disease modeller at the London School of Hygiene and Tropical Medicine.

PUBLIC DATA ON COVID-19 CASES IN SOUTH KOREA RAISE PRIVACY FEARS

South Korea has put in place some of the world's most extensive tracing, testing and isolation measures — and these have helped to reduce the virus's spread, say the World Health Organization and other experts. But the specificity of the publicly available data related to this has raised privacy concerns. Data trails released about some of the infected people have been so detailed that the individuals could be identifiable, say some researchers.

For the past month, South Korean residents have been receiving emergency text messages from authorities, alerting them to the movements of local people with COVID-19.

A typical alert can contain the infected person's age and gender, and a detailed log of their movements down to the minute — in some cases traced using closed-circuit television and credit-card transactions, with the time and names of businesses they visited. Even overnight stays at 'love motels' have been noted. Numerous websites and smartphone apps have sprung up to collect and map the data.

Choi Young-ae, chair of the National Human Rights Commission of Korea, said on 9 March that the "excessive disclosure of private information" could cause people with symptoms to avoid testing.